

CLAIMS

What is claimed is:

1. A method, comprising:
extracting a time domain impulse response from parameters that characterize a communication channel;
generating a probability distribution function (PDF) of an output voltage based on the impulse response; and
computing a relationship between bit error rate and voltage margin based on the final probability distribution function.
2. The method of claim 1 wherein generating the PDF comprises quantizing the impulse response into a plurality of quantized levels.
3. The method of claim 2 wherein generating the PDF further comprises assigning taps to the quantized levels and determining a number of taps assigned to each quantized level.
4. The method of claim 3 wherein generating the PDF further comprises determining allowable voltage levels for each quantized level.
5. The method of claim 4 wherein generating the PDF further comprises determining a probability of occurrence of each allowable voltage level, determining a

PDF for each voltage level; and convolving all of the PDFs for the various voltage levels to obtain the PDF of the output voltage.

6. The method of claim 5 further comprising estimating a voltage margin for a receiver and using the relationship between bit error rate and voltage margin to determine a corresponding bit error rate.

7. The method of claim 1 further comprising estimating a voltage margin for a receiver and using the relationship between bit error rate and voltage margin to determine a corresponding bit error rate.

8. The method of claim 7 further comprising refining an architecture associated with the receiver based on the determined bit error rate.

9. A computer accessible storage medium containing software that, when executed by a processor, causes the processor to:

extract a time domain impulse response from parameters that characterize a communication channel;

generate a probability distribution function (PDF) of an output voltage based on the impulse response; and

compute a relationship between bit error rate and voltage margin based on the final probability distribution function.

10. The storage medium of claim 9 wherein the software causes the processor to generate the PDF of the output voltage by causing the processor to quantize the impulse response into a plurality of quantized levels.

11. The storage medium of claim 10 wherein the software causes the processor to generate the PDF of the output voltage by further causing the processor to assign taps to the quantized levels and determine a number of taps assigned to each quantized level.

12. The storage medium of claim 11 wherein the software causes the processor to generate the PDF of the output voltage by further causing the processor to determine allowable voltage levels for each quantized level.

13. The storage medium of claim 12 wherein the software causes the processor to generate the PDF of the output voltage by further causing the processor to determine a probability of occurrence of each allowable voltage level, determine a PDF for each voltage level; and convolve all of the PDFs for the various voltage levels to obtain the PDF of the output voltage.

14. The storage medium of claim 13 wherein the software further causes the processor to permit a user to estimate a voltage margin for a receiver and to use the relationship between bit error rate and voltage margin to determine a corresponding bit error rate.

15. The storage medium of claim 9 wherein the software further causes the processor to permit a user to estimate a voltage margin for a receiver and, using the relationship between bit error rate and voltage margin, to determine a corresponding bit error rate.

16. A system, comprising:

a processor;

a storage device accessible to the processor and on which software is stored, the software adapted to be executed by the processor to cause the processor to:

extract a time domain impulse response from parameters that characterize a communication channel;

generate a probability distribution function (PDF) of an output voltage based on the impulse response; and

compute a relationship between bit error rate and voltage margin based on the final probability distribution function.

17. The system of claim 16 wherein the software causes the processor to generate the PDF of the output voltage by causing the processor to quantize the impulse response into a plurality of quantized levels.

18. The system of claim 17 wherein the software causes the processor to generate the PDF of the output voltage by further causing the processor to assign taps to the quantized levels and determine a number of taps assigned to each quantized level.

19. The system of claim 18 wherein the software causes the processor to generate the PDF of the output voltage by further causing the processor to determine allowable voltage levels for each quantized level.

20. The system of claim 19 wherein the software causes the processor to generate the PDF of the output voltage by further causing the processor to determine a probability of occurrence of each allowable voltage level, determine a PDF for each voltage level; and convolve all of the PDFs for the various voltage levels to obtain the PDF of the output voltage.

21. The system of claim 20 wherein the software further causes the processor to permit a user to estimate a voltage margin for a receiver and to use the relationship between bit error rate and voltage margin to determine a corresponding bit error rate.

22. The system of claim 16 wherein the software further causes the processor to permit a user to estimate a voltage margin for a receiver and, using the relationship between bit error rate and voltage margin, to determine a corresponding bit error rate.